```
FFFFFFFFFFFFFFF     000000000     RRRRRRRRRRRR     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
FFFFFFFFFFFFFFF     000000000     RRRRRRRRRRRR     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
FFFFFFFFFFFFFFF     000000000     RRRRRRRRRRRR     RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
FFF               000         000 RRR         RRR RRR         RRR       TTT        LLL
FFF               000         000 RRR         RRR RRR         RRR       TTT        LLL
FFF               000         000 RRR         RRR RRR         RRR       TTT        LLL
FFF               000         000 RRR         RRR RRR         RRR       TTT        LLL
FFF               000         000 RRR         RRR RRR         RRR       TTT        LLL
FFF               000         000 RRR         RRR RRR         RRR       TTT        LLL
FFFFFFFFFFFF      000         000 RRRRRRRRRRRR    RRRRRRRRRRRR          TTT        LLL
FFFFFFFFFFFF      000         000 RRRRRRRRRRRR    RRRRRRRRRRRR          TTT        LLL
FFFFFFFFFFFF      000         000 RRRRRRRRRRRR    RRRRRRRRRRRR          TTT        LLL
FFF               000         000 RRR   RRR       RRR   RRR             TTT        LLL
FFF               000         000 RRR   RRR       RRR   RRR             TTT        LLL
FFF               000         000 RRR   RRR       RRR   RRR             TTT        LLL
FFF               000         000 RRR     RRR     RRR     RRR           TTT        LLL
FFF               000         000 RRR     RRR     RRR     RRR           TTT        LLL
FFF               000         000 RRR     RRR     RRR     RRR           TTT        LLL
FFF                 000000000     RRR         RRR RRR         RRR       TTT        LLLLLLLLLLLLLLL
FFF                 000000000     RRR         RRR RRR         RRR       TTT        LLLLLLLLLLLLLLL
FFF                 000000000     RRR         RRR RRR         RRR       TTT        LLLLLLLLLLLLLLL
```

```
FFFFFFFFFF    000000    RRRRRRRR    EEEEEEEEEE  RRRRRRRR    RRRRRRRR      000000    RRRRRRRR
FFFFFFFFFF    000000    RRRRRRRR    EEEEEEEEEE  RRRRRRRR    RRRRRRRR      000000    RRRRRRRR
FF          00      00  RR      RR  EE          RR      RR  RR      RR  00      00  RR      RR
FF          00      00  RR      RR  EE          RR      RR  RR      RR  00      00  RR      RR
FF          00      00  RR      RR  EE          RR      RR  RR      RR  00      00  RR      RR
FF          00      00  RR      RR  EE          RR      RR  RR      RR  00      00  RR      RR
FFFFFFFF    00      00  RRRRRRRRR   EEEEEEEE    RRRRRRRR    RRRRRRRR    00      00  RRRRRRRRR
FFFFFFFF    00      00  RRRRRRRRR   EEEEEEEE    RRRRRRRR    RRRRRRRR    00      00  RRRRRRRRR
FF          00      00  RR   RR     EE          RR   RR     RR   RR     00      00  RR   RR
FF          00      00  RR   RR     EE          RR   RR     RR   RR     00      00  RR   RR
FF          00      00  RR    RR    EE          RR    RR    RR    RR    00      00  RR    RR      ....
FF          00      00  RR    RR    EE          RR    RR    RR    RR    00      00  RR    RR      ....
FF            000000    RR      RR  EEEEEEEEEE  RR      RR  RR      RR    000000    RR      RR  ....
FF            000000    RR      RR  EEEEEEEEEE  RR      RR  RR      RR    000000    RR      RR  ....

LL              IIIIII      SSSSSSSS
LL              IIIIII    SSSSSSSS
LL                II      SS
LL                II      SS
LL                II      SS
LL                II      SS
LL                II        SSSSSS
LL                II        SSSSSS
LL                II              SS
LL                II              SS
LL                II              SS
LL                II              SS
LLLLLLLLLL      IIIIII    SSSSSSSS
LLLLLLLLLL      IIIIII    SSSSSSSS
```

```
;     1          0001  0 MODULE FOR$$ERROR (%TITLE 'Internal FORTRAN error handling module'
;     2          0002  0                     IDENT = '1-022'          ! File: FORERROR.B32  Edit: SBL1022
;     3          0003  0                     ) =
;     4          0004  1 BEGIN
;     5          0005  1 !
;     6          0006  1 !****************************************************************************
;     7          0007  1 !*                                                                          *
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;    25          0025  1 !*                                                                          *
;    26          0026  1 !*                                                                          *
;    27          0027  1 !****************************************************************************
;    28          0028  1 !
;    29          0029  1
;    30          0030  1 !++
;    31          0031  1 ! FACILITY:  FORTRAN support library
;    32          0032  1 !
;    33          0033  1 ! ABSTRACT:
;    34          0034  1 !
;    35          0035  1 !       This module contains the error handlers needed by
;    36          0036  1 !       the common OTS for handling FORTRAN errors.  In particular
;    37          0037  1 !       there is a handler for errors in OPEN/CLOSE where ERR=
;    38          0038  1 !       means error return to caller rather than a transfer.
;    39          0039  1 !       A second handler (FOR$$ERR_END_HND is provided
;    40          0040  1 !       for I/O statements where the optional ERR= and END=
;    41          0041  1 !       constructs require a transfer of control to the
;    42          0042  1 !       user program rather than an an error return.
;    43          0043  1 !       A third handler, FOR$$IOSTAT_HND is for auxilliary I/O statements
;    44          0044  1 !       which either undwind with R0 containing an IOSTAT value or
;    45          0045  1 !       resignal.
;    46          0046  1 !       An argument specifies the cleanup to be performed if UNWIND occurs.
;    47          0047  1 !
;    48          0048  1 ! ENVIRONMENT:  User mode, AST level or not or mixed.
;    49          0049  1 !               Note: this module is both shared (with no entry vectors) and non-shared
;    50          0050  1 !               if FORTRAN compatibility routines call.
;    51          0051  1 !
;    52          0052  1 ! AUTHOR: Thomas N. Hastings, CREATION DATE: 03-Jun-77
;    53          0053  1 !
;    54          0054  1 ! MODIFIED BY:
;    55          0055  1 !
;    56          0056  1 !       Thomas N. Hastings, 03-Jun-77: VERSION 01
;    57          0057  1 !       Steven B. Lionel, VAX/VMS V2.0
```

```
;    58          0058  1 ! [Previous edit history deleted.  SBL 30-Sep-1982]
;    59          0059  1 ! 1-019 - Look at FAO_COUNT in signal list to see where USER_PC is.  SBL 10-NOV-1980
;    60          0060  1 ! 1-020 - Reset RAB$L_UBF and RAB$W_USZ in CLEANUP_LUB.  JAW 08-Jun-1981
;    61          0061  1 ! 1-021 - Change OTS$$ data structure references to FOR$$.  SBL 30-Sep-1982
;    62          0062  1 ! 1-022 - Look at FAB$W_IFI instead of LUB$W_IFI in CLEANUP_LUB.  QAR #1229.
;    63          0063  1 !         SBL 7-Mar-1984
;    64          0064  1 !--
;    65          0065  1
```

```
;    67          0066  1 !
;    68          0067  1 ! PROLOGUE FILE:
;    69          0068  1 !
;    70          0069  1
;    71          0070  1 REQUIRE 'RTLIN:FORPROLOG';                      ! FORTRAN definitions
;    72          0136  1
;    73          0137  1 !
;    74          0138  1 ! TABLE OF CONTENTS:
;    75          0139  1 !
;    76          0140  1
;    77          0141  1 FORWARD ROUTINE
;    78          0142  1     FOR$$ERR_OPECLO,                            ! Error handler for OPEN/CLOSE
;    79          0143  1     FOR$$ERR_ENDHND,                            ! ERR=/END= handler for I/O statements
;    80          0144  1     FOR$$IOSTAT_HND,                            ! IOSTAT only handler
;    81          0145  1     FOR$$IO_IN_PROG,                            ! I/O in progress handler
;    82          0146  1     CLEANUP_LUB : NOVALUE;                      ! Perform appropriate LUB cleanup if UNWIND.
;    83          0147  1                                                 ! signal list.
;    84          0148  1
;    85          0149  1 !
;    86          0150  1 ! EQUATED SYMBOLS:
;    87          0151  1 !
;    88          0152  1 !       NONE
;    89          0153  1 !
;    90          0154  1 ! OWN STORAGE:
;    91          0155  1 !
;    92          0156  1 !       NONE
;    93          0157  1 !
;    94          0158  1 ! EXTERNAL REFERENCES:
;    95          0159  1 !
;    96          0160  1 !+
;    97          0161  1 ! MAINTENANCE NOTE:  Since this module is called by FORTRAN compatibility
;    98          0162  1 ! routines which are un-shared and the entry points are not vectored,
;    99          0163  1 ! a separate copy of this module is linked with the user program when
;   100          0164  1 ! the user calls a FORTRAN compatibility routine.  In order to prevent
;   101          0165  1 ! data truncation errors from the linker, all external references are
;   102          0166  1 ! of addressing mode general (rather than word displacement) even for
;   103          0167  1 ! the same PSECT.
;   104          0168  1 !-
;   105          0169  1
;   106          0170  1 EXTERNAL ROUTINE
;   107          0171  1     FOR$$CB_GET : JSB_CB_GET NOVALUE,           ! Get current LUB/ISB/RAB
;   108          0172  1                                                 ! Note: this non-shared routine is loaded if
;   109          0173  1                                                 ! compatibility routines call, so can't reference
;   110          0174  1                                                 ! FOR$$A_CUR_LUB directly.
;   111          0175  1     FOR$$CB_POP : JSB_CB_POP NOVALUE,           ! Pop current LUB/ISB/RAB
;   112          0176  1                                                 ! as specified by CCB.
;   113          0177  1     FOR$$FP_MATCH : CALL_CCB NOVALUE,           ! Match FP in ISB chain
;   114          0178  1     FOR$$FREE_VM,                               ! Free virtual memory
;   115          0179  1     FOR$$CLOSE_FILE,                            ! RMS Close a file
;   116          0180  1     FOR$$SIG_FATINT : NOVALUE,                  ! SIGNAL_STOP OTS$_FATINTERR
;   117          0181  1     FOR$$SIG_DATCOR : NOVALUE,                  ! SIGNAL_STOP OTS$_INTDATCOR
;   118          0182  1                                                 ! (FATAL INTERNAL ERROR IN RUN-TIME LIBRARY)
;   119          0183  1     LIB$SIG_TO_RET;                             ! convert a SIGNAL to error return
;   120          0184  1                                                 ! to caller of establisher with R0 set to signal value.
;   121          0185  1
```

```
;  123     0186  1 GLOBAL ROUTINE FOR$$ERR_OPECLO (                  ! Error condition handler for OPEN/CLOSE
;  124     0187  1         SIG_ARGS_ADR,                              ! Adr. of SIGNAL args
;  125     0188  1         MCH_ARGS_ADR,                              ! Adr. of mechanism args
;  126     0189  1         ENB_ARGS_ADR)                              ! Adr.  of ENABLE declared args
;  127     0190  1     =                                              ! Condition handlers always have values
;  128     0191  1
;  129     0192  1 !++
;  130     0193  1 ! FUNCTIONAL DESCRIPTION:
;  131     0194  1 !
;  132     0195  1 !       FOR$$ERR_OPECLO is an error conditon handler established by
;  133     0196  1 !       the OPEN and CLOSE statement procedures.  If the user specified
;  134     0197  1 !       an ERR= keyword parameter, the handler unwinds the stack after
;  135     0198  1 !       storing the signaled error condition in the saved image of R0.
;  136     0199  1 !       Otherwise, FOR$$ERR_OPECLO just resignals by simply returning
;  137     0200  1 !       SS$_RESIGNAL (to CHF).
;  138     0201  1 !       If and when an UNWIND occurs, the ENABLE arg UNWIND_ACT_ADR
;  139     0202  1 !       specifies whether the LUB/ISB/RAB is to be pop, returned, or no-opped.
;  140     0203  1 !       It is not popped if it had not yet been pushed as indicated
;  141     0204  1 !       by the ENABLE arg UNWIND_ACT_ADR.
;  142     0205  1 !
;  143     0206  1 !       If ERR= and IOSTAT were both specified, then the returned
;  144     0207  1 !       value is the FORTRAN small integer error code.
;  145     0208  1 !
;  146     0209  1 ! FORMAL PARAMETERS:
;  147     0210  1 !
;  148     0211  1 !       SIG-ARG-ADR
;  149     0212  1 !       SIG_ARGS_ADR.rl.ra      Adr. of Signal arg list
;  150     0213  1 !       MCH_ARGS_ADR.rl.ra      Adr. of mechanism arg list
;  151     0214  1 !       ENB_ARGS_ADR.rl.ra      Adr. of ENABLE arg list which contains:
;  152     0215  1 !           ENABLE_COUNT.rbu.v  No. of longword following in ENABLE arg list
;  153     0216  1 !           UNWIND_ACT_ADR.rl.r Adr. of longword containing UNWIND action code.
;  154     0217  1 !                               Any of FOR$K_UNWINDNOP, FOR$K_UNWINDPOP,
;  155     0218  1 !                               FOR$K_UNWINDRET.
;  156     0219  1 !               [OPECLO_ADR.rlu.ra] Optional adr. of cannonical array of OPEN or CLOSE keyword
;  157     0220  1 !                               parameters after the encoded user parameter
;  158     0221  1 !                               list has been scanned and expanded into it.
;  159     0222  1 !                               Symbolic offsets into ENB_ARGS_ADR[1,OPEN$K_name] are of the
;  160     0223  1 !                               form OPEN$K_name as defined in FOROPN REQUIRE file.
;  161     0224  1 !                               If ommitted, assume no ERR= (DEFINE FILE, REWIND, etc)
;  162     0225  1 !
;  163     0226  1 ! IMPLICIT INPUTS:
;  164     0227  1 !
;  165     0228  1 !       FOR$$A_CUR_LUB          Adr. of current LUB/ISB/RAB or 0
;  166     0229  1 !                               Note: obtained by calling FOR$$CB_GET
;  167     0230  1 !                                     rather than directly.
;  168     0231  1 !
;  169     0232  1 ! IMPLICIT OUTPUTS:
;  170     0233  1 !
;  171     0234  1 !       SIG_ARGS_ADR[SIG$_USER_PC]      Set to user call PC to RTL
;  172     0235  1 !
;  173     0236  1 ! COMPLETION CODES:
;  174     0237  1 !
;  175     0238  1 !       SS$_RESIGNAL if no ERR= was specified
;  176     0239  1 !       SS$_NORMAL if ERR= was specified (ignored by CHF on UNWIND)
;  177     0240  1 !
;  178     0241  1 ! SIDE EFFECTS:
;  179     0242  1 !
```

```
;  180     0243  1 !       If the user has specified ERR=, the stack is unwound to the
;  181     0244  1 !       caller of the establisher (i.e., the user program) with the save image
;  182     0245  1 !       of R0 set to the error status.
;  183     0246  1 !       If no ERR= was specified,the error conditon is resignaled.
;  184     0247  1 !       If UNWIND call, the current LUB/ISB/RAB may be popped or returned.
;  185     0248  1 !--
;  186     0249  1
;  187     0250  2     BEGIN
;  188     0251  2
;  189     0252  2     BUILTIN
;  190     0253  2         CALLG,
;  191     0254  2         AP;
;  192     0255  2
;  193     0256  2     LITERAL                                     ! Define ENABLE arglist offsets
;  194     0257  2         ENABLE_COUNT = 0,                       ! Offset in ENB_ARGS_ADR of no. of enable args following
;  195     0258  2         UNWIND_ACT_ADR = 1,                     ! Adr. of longword containing
;  196     0259  2                                                 ! UNWIND action code.
;  197     0260  2         OPECLO_ADR = 2;                         ! Adr. of OPEN/CLOSE cannonical array
;  198     0261  2
;  199     0262  2     MAP
;  200     0263  2         SIG_ARGS_ADR : REF BLOCK [, BYTE],      ! SIGNAL args
;  201     0264  2         MCH_ARGS_ADR : REF BLOCK [, BYTE],      ! mechanism args
;  202     0265  2         ENB_ARGS_ADR : REF VECTOR [OPECLO_ADR, LONG];   !ENABLE args list array
;  203     0266  2
;  204     0267  2     LOCAL
;  205     0268  2         EST_FP : REF BLOCK [, BYTE],            ! Establisher's FP
;  206     0269  2         SIG_PC_LOC: REF VECTOR [, LONG],        ! Location of user PC in signal list
;  207     0270  2         OPECLO_ARRAY : REF VECTOR [OPEN$K_KEY_MAX + 1, LONG];   ! OPEN/CLOSE cannonical array
;  208     0271  2
;  209     0272  2     !+
;  210     0273  2     ! If this is unwind condition, perform cleanup. since
;  211     0274  2     ! Perform LUB cleanup indicated by EBABLE arg UNWIND_ACT_ADR
;  212     0275  2     ! (set by the establisher).
;  213     0276  2     !-
;  214     0277  2
;  215     0278  2     IF .BLOCK [SIG_ARGS_ADR [CHF$L_SIG_NAME], STS$V_COND_ID;, BYTE] EQL (SS$_UNWIND^-3)
;  216     0279  2     THEN
;  217     0280  3         BEGIN
;  218     0281  3         CLEANUP_LUB (..ENB_ARGS_ADR [UNWIND_ACT_ADR]);
;  219     0282  3         RETURN SS$_NORMAL;
;  220     0283  3         END;
;  221     0284  2
;  222     0285  2     OPECLO_ARRAY = .ENB_ARGS_ADR [OPECLO_ADR];
;  223     0286  2
;  224     0287  2     !+
;  225     0288  2     ! If this is not a FOR$ error or if another RTL handler has seen this
;  226     0289  2     ! error (noted by signal argument for user PC being non-zero) then
;  227     0290  2     ! just resignal.
;  228     0291  2     !-
;  229     0292  2
;  230     0293  2     IF .BLOCK [SIG_ARGS_ADR [CHF$L_SIG_NAME], STS$V_FAC_NO;, BYTE] NEQ FOR$K_FAC_NO
;  231     0294  2     THEN
;  232     0295  2         RETURN SS$_RESIGNAL;
;  233     0296  2
;  234     0297  2     SIG_PC_LOC = SIG_ARGS_ADR [CHF$L_SIG_ARG1] + (.SIG_ARGS_ADR [CHF$L_SIG_ARG1] * %UPVAL);
;  235     0298  2     IF .SIG_PC_LOC [0] NEQ 0
;  236     0299  2     THEN
```

```
;  237     0300  2          RETURN SS$_RESIGNAL;
;  238     0301  2
;  239     0302  2      !+
;  240     0303  2      ! Check if user provided ERR= keyword or not.  If yes, convert signal to
;  241     0304  2      ! a return to the caller of the establisher with condition value in R0.
;  242     0305  2      ! If IOSTAT is present, act as if ERR= is also.
;  243     0306  2      ! If caller omitted OPECLO_ADR entry in ENB_ARGS_ADR, treat as if no ERR=.
;  244     0307  2      !-
;  245     0308  2
;  246     0309  2      IF .ENB_ARGS_ADR [ENABLE_COUNT] GEQU OPECLO_ADR AND (.OPECLO_ARRAY [OPEN$K_ERR] OR .OPECLO_ARRAY [
;  247     0310  2          OPEN$K_IOSTAT]) NEQ 0
;  248     0311  2      THEN
;  249     0312  3          BEGIN
;  250     0313  3
;  251     0314  3          !+
;  252     0315  3          ! If IOSTAT was specified, store the value.
;  253     0316  3          !-
;  254     0317  3
;  255     0318  3          IF .OPECLO_ARRAY [OPEN$K_IOSTAT] NEQ 0
;  256     0319  3          THEN
;  257     0320  4              BEGIN
;  258     0321  4
;  259     0322  4              LOCAL
;  260     0323  4                  IOSTAT;
;  261     0324  4
;  262     0325  4              IOSTAT = .BLOCK [SIG_ARGS_ADR [CHF$L_SIG_NAME], STS$V_CODE;, BYTE];
;  263     0326  4
;  264     0327  4              IF .OPECLO_ARRAY [OPEN$K_IOSTAT_L]
;  265     0328  4              THEN
;  266     0329  4                  .OPECLO_ARRAY [OPEN$K_IOSTAT] = .IOSTAT
;  267     0330  4              ELSE
;  268     0331  5                  BEGIN
;  269     0332  5
;  270     0333  5                  LOCAL
;  271     0334  5                      IOSTAT_ADR : REF BLOCK [, BYTE];
;  272     0335  5
;  273     0336  5                  IOSTAT_ADR = .OPECLO_ARRAY [OPEN$K_IOSTAT];
;  274     0337  5                  IOSTAT_ADR [0, 0, 16, 0] = .IOSTAT;
;  275     0338  4                  END;
;  276     0339  4
;  277     0340  3              END;
;  278     0341  3
;  279     0342  3          IF NOT CALLG (.AP, LIB$SIG_TO_RET) THEN FOR$$SIG_FATINT ()
;  280     0343  3
;  281     0344  3          END
;  282     0345  2      ELSE
;  283     0346  2
;  284     0347  2      !+
;  285     0348  2      ! No ERR=, so set user call PC saved in stack frame of establisher and RESIGNAL
;  286     0349  2      !-
;  287     0350  2
;  288     0351  3          BEGIN
;  289     0352  3          EST_FP = .MCH_ARGS_ADR [CHF$L_MCH_FRAME];
;  290     0353  3          SIG_PC_LOC [0] = .EST_FP [SF$L_SAVE_PC];
;  291     0354  3
;  292     0355  2          END;                                    ! End no ERR=
;  293     0356  2
```

```
;   2      !+
;   2      ! Return resignal condition (ignored if SYS$UNWIND called).
;   2      !-
;   2
;   2      RETURN SS$_RESIGNAL
;   1      END;                                               ! End of FOR$$ERR_OPECLO handler

                                                              .TITLE  FOR$$ERROR Internal FORTRAN error handling modu
;                                                                                        le
                                                              .IDENT  \1-022\

                                                              .EXTRN  FOR$$CB_GET, FOR$$CB_POP
                                                              .EXTRN  FOR$$FP_MATCH, FOR$$FREE_VM
                                                              .EXTRN  FOR$$CLOSE_FILE
                                                              .EXTRN  FOR$$SIG_FATINT
                                                              .EXTRN  FOR$$SIG_DATCOR
                                                              .EXTRN  LIB$SIG_TO_RET

                                                              .PSECT  _FOR$CODE,NOWRT,  SHR,  PIC,2

                                            000C 00000        .ENTRY  FOR$$ERR_OPECLO, Save R2,R3                     ; 0186
                        52      04    AC    D0 00002          MOVL    SIG_ARGS_ADR, R2                                ; 0278
00000124  8F    04  A2  19            03    ED 00006          CMPZV   #3, #25, 4(R2), #292                            ;
                                      10    12 00010          BNEQ    1$                                              ;
                        50      0C    AC    D0 00012          MOVL    ENB_ARGS_ADR, R0                                ; 0281
                                04    B0    DD 00016          PUSHL   @4(R0)                                          ;
                 0000V  CF            01    FB 00019          CALLS   #1, CLEANUP_LUB                                 ;
                        50            01    D0 0001E          MOVL    #1, R0                                          ; 0282
                                            04 00021          RET                                                     ;
                        53      0C    AC    D0 00022 1$:      MOVL    ENB_ARGS_ADR, R3                                ; 0285
                        50      08    A3    D0 00026          MOVL    8(R3), OPECLO_ARRAY                             ;
          18    06  A2  0C            00    ED 0002A          CMPZV   #0, #12, 6(R2), #24                             ; 0293
                                      54    12 00030          BNEQ    5$                                              ;
                        51      08    A2    D0 00032          MOVL    8(R2), R1                                       ; 0297
                        51      08  A241    DE 00036          MOVAL   8(R2)[R1], SIG_PC_LOC                           ;
                                      61    D5 0003B          TSTL    (SIG_PC_LOC)                                    ; 0298
                                      47    12 0003D          BNEQ    5$                                              ;
                        02            63    D1 0003F          CMPL    (R3), #2                                        ; 0309
                                      36    1F 00042          BLSSU   4$                                              ;
                53  0C  A0      58    A0    C9 00044          BISL3   88(OPECLO_ARRAY), 12(OPECLO_ARRAY), R3          ;
                                      2E    13 0004A          BEQL    4$                                              ; 0310
                        53      58    A0    D0 0004C          MOVL    88(OPECLO_ARRAY), R3                            ; 0318
                                      15    13 00050          BEQL    3$                                              ;
          52    04  A2  0C            03    EF 00052          EXTZV   #3, #12, 4(R2), IOSTAT                          ; 0325
                        05      64    A0    E9 00058          BLBC    100(OPECLO_ARRAY), 2$                           ; 0327
                        63            52    D0 0005C          MOVL    IOSTAT, (R3)                                    ; 0329
                                      06    11 0005F          BRB     3$                                              ;
                        50            53    D0 00061 2$:      MOVL    R3, IOSTAT_ADR                                  ; 0336
                        60            52    B0 00064          MOVW    IOSTAT, (IOSTAT_ADR)                            ; 0337
             00000000G  00            6C    FA 00067 3$:      CALLG   (AP), LIB$SIG_TO_RET                            ; 0342
                        15            50    E8 0006E          BLBS    R0, 5$                                          ;
             00000000G  00            00    FB 00071          CALLS   #0, FOR$$SIG_FATINT                             ;
                                      0C    11 00078          BRB     5$                                              ;
                        50      08    AC    D0 0007A 4$:      MOVL    MCH_ARGS_ADR, R0                                ; 0352
                        50      04    A0    D0 0007E          MOVL    4(R0), EST_FP                                   ;
                        61      10    A0    D0 00082          MOVL    16(EST_FP), (SIG_PC_LOC)                        ; 0353
```

```
                                50     0918   8F  3C 00086 5$:     MOVZWL  #2328, R0                       ; 0361
                                                04 0008B         RET                                     ; 0362

; Routine Size:  140 bytes,    Routine Base:  _FOR$CODE + 0000

;  300          0363  1
```

```
;  302     0364  1 GLOBAL ROUTINE FOR$$ERR_ENDHND (                      ! FORTRAN I/O statement ERR=/END= error condition handler
;  303     0365  1         SIG_ARGS_ADR,                                 ! Adr. of signal arg list
;  304     0366  1         MCH_ARGS_ADR,                                 ! Adr. of mechanism arg list
;  305     0367  1         ENB_ARGS_ADR)                                 ! Adr. of ENABLE arg list
;  306     0368  1     =                                                 ! Return status for a condition handler
;  307     0369  1
;  308     0370  1 !++
;  309     0371  1 ! FUNCTIONAL DESCRIPTION:
;  310     0372  1 !
;  311     0373  1 !       FOR$$ERR_ENDHND is an error condition handler established
;  312     0374  1 !       by each I/O statement which has an  ERR= and END= error transfer
;  313     0375  1 !       mechanism (as an option of the user program).
;  314     0376  1 !
;  315     0377  1 !       If the signaled condition is FOR$_ENDDURREA (24='END-OF_FILE DURING READ')
;  316     0378  1 !       and an END= has been specified by the user in his I/O statement
;  317     0379  1 !       (.END_EQL_ADR NEQ 0), the handler unwinds to the user specified address (by calling
;  318     0380  1 !       SYS$UNWIND with depth equal to CHF$L_MCH_DEPTH + ..INCR_DEPTH_ADR + 1)
;  319     0381  1 !       and new_PC equal to ..END_EQL_ADR.
;  320     0382  1 !       Otherwise, if an ERR= had been specified by the user in his I/O statement
;  321     0383  1 !       (ERR_EQUL NEQ 0), the handler unwinds to the user specified address
;  322     0384  1 !       by calling SYS$UNWIND with depth equal to CHF$L_MCH_DEPTH + ..INCR_DEPTH_ADR + 1
;  323     0385  1 !       and new_PC equal to ..ERR_EQL_ADR.
;  324     0386  1 !
;  325     0387  1 !       If neither of the above cases holds, the error is resignaled
;  326     0388  1 !       so that a user handler or the OTS default handler will get invoked.
;  327     0389  1 !       If UNWIND occurs, the appropriate cleanup takes place,
;  328     0390  1 !       as indicated by the establisher in the ENABLE arg UNWIND_ACT_ADR.
;  329     0391  1 !       If FOR$K_UNWINDPOP is indicated, the current LUB/ISB/RAB is popped.
;  330     0392  1 !       If FOR$K_UNWINDRET is indicated, the LUB/ISB/RAB is returned and the
;  331     0393  1 !       file closed.
;  332     0394  1 !       Otherwise (FOR$K_UNWINDNOP) nothing is done.
;  333     0395  1 !
;  334     0396  1 ! FORMAL PARAMETERS:
;  335     0397  1 !
;  336     0398  1 !       SIG_ARGS_ADR.ml.ra      Adr. of signal arg list
;  337     0399  1 !       MCH_ARGS_ADR.ml.ra      Adr. of mechanism arg list
;  338     0400  1 !       ENB_ARGS_ADR.ml.ra      Adr. of ENABLE arg list which contains:
;  339     0401  1 !           UNWIND_ACT_ADR.rl.r Adr. of longword contining UNWIND action code.
;  340     0402  1 !                               Any of FOR$K_UNWINDNOP, FOR$K_UNWINDPOP,
;  341     0403  1 !                               FOR$K_UNWINDRET.
;  342     0404  1 !           ERR_EQL_ADR.ra.r    Adr. of longword containing Adr. of the user address
;  343     0405  1 !                               to be transferred to or 0 on any error condition
;  344     0406  1 !           END_EQL_ADR.ra.r    Adr of longword containing Adr. of the user address
;  345     0407  1 !                               to be transferred to or 0 on end-of-file
;  346     0408  1 !           INCR_DEPTH_ADR.rl.r Adr. of longword containing Incremental no. of frames between the establishe
;  347     0409  1 !                               and the users program (usually 0 or 1).
;  348     0410  1 ! Note: All parameters to a condition handler must be addresses of values in BLISS if used in an ENABLE.
;  349     0411  1 !
;  350     0412  1 ! IMPLICIT INPUTS:
;  351     0413  1 !
;  352     0414  1 !       FOR$$A_CUR_LUB          Adr. of current LUB/ISB/RAB or 0
;  353     0415  1 !                               Note: obtained by calling FOR$$CB_GET rather than directly.
;  354     0416  1 !
;  355     0417  1 ! IMPLICIT OUTPUTS:
;  356     0418  1 !
;  357     0419  1 !       SIG_ARGS_ADR[SIG$_USER_PC]      Set to user call PC to RTL
;  358     0420  1 !
```

```
;  359     0421  1 ! COMPLETION CODES:
;  360     0422  1 !
;  361     0423  1 !       SS$_RESIGNAL if no ERR= or END= was specified by user, so that
;  362     0424  1 !       a user handler or the default OTS handler will get a chance.
;  363     0425  1 !       SS$_NORMAL if unwind called (although ignored if unwind called)
;  364     0426  1 !
;  365     0427  1 ! SIDE EFFECTS:
;  366     0428  1 !
;  367     0429  1 !       If END= and EOF OR ERR= was specified, the stack is unwound
;  368     0430  1 !       to user and new_PC is set from ..END_EQL_ADR or .ERR_EQL_ADR.
;  369     0431  1 !       If unwind, the current LUB/ISB/RAB may be popped or returned.
;  370     0432  1 !--
;  371     0433  1
;  372     0434  2     BEGIN
;  373     0435  2
;  374     0436  2     LOCAL
;  375     0437  2         EST_FP : REF BLOCK [, BYTE],                ! Establisher's FP
;  376     0438  2         SIG_PC_LOC: REF VECTOR [, LONG];            ! Location of user PC in signal list
;  377     0439  2
;  378     0440  2     LITERAL                                         ! Declare offsets in ENABLE VECTOR arg list
;  379     0441  2         UNWIND_ACT_ADR = 1,                         ! UNWIND action code
;  380     0442  2         ERR_EQL_ADR = 2,                            ! ERR= adr or 0
;  381     0443  2         END_EQL_ADR = 3,                            ! END= adr or 0
;  382     0444  2         INCR_DEPTH_ADR = 4;                         ! incremental depth
;  383     0445  2
;  384     0446  2     MAP
;  385     0447  2         SIG_ARGS_ADR : REF BLOCK [, BYTE],          ! SIGNAL arg list
;  386     0448  2         MCH_ARGS_ADR : REF BLOCK [, BYTE],          ! mechanism arg list
;  387     0449  2         ENB_ARGS_ADR : REF VECTOR [INCR_DEPTH_ADR + 1, LONG];   ! ENABLE arg list
;  388     0450  2
;  389     0451  2
;  390     0452  2     !+
;  391     0453  2     ! Check for unwinding since handler gets called when it does an unwind.
;  392     0454  2     ! If unwind, perform cleanup indicated by ENABLE arg UNWIND_ACT_ADR.
;  393     0455  2     ! Then return to the unwinder to keep unwinding (return value ignored).
;  394     0456  2     !-
;  395     0457  2
;  396     0458  2     IF .BLOCK [SIG_ARGS_ADR [CHF$L_SIG_NAME], STS$V_COND_ID;, BYTE] EQL (SS$_UNWIND^-3)
;  397     0459  2     THEN
;  398     0460  3         BEGIN
;  399     0461  3         CLEANUP_LUB (..ENB_ARGS_ADR [UNWIND_ACT_ADR]);
;  400     0462  3         RETURN SS$_NORMAL;
;  401     0463  3         END;
;  402     0464  2
;  403     0465  2     !+
;  404     0466  2     ! If error is not a FOR$ error or if another RTL handler has seen
;  405     0467  2     ! this error then resignal.
;  406     0468  2     !-
;  407     0469  2
;  408     0470  2     IF .BLOCK [SIG_ARGS_ADR [CHF$L_SIG_NAME], STS$V_FAC_NO;, BYTE] NEQ FOR$K_FAC_NO
;  409     0471  2     THEN
;  410     0472  2         RETURN SS$_RESIGNAL;
;  411     0473  2
;  412     0474  2     SIG_PC_LOC = SIG_ARGS_ADR [CHF$L_SIG_ARG1] + (.SIG_ARGS_ADR [CHF$L_SIG_ARG1] * %UPVAL);
;  413     0475  2     IF .SIG_PC_LOC [0] NEQ 0
;  414     0476  2     THEN
;  415     0477  2         RETURN SS$_RESIGNAL;
```

```
;  416     0478  2
;  417     0479  2      !+
;  418     0480  2      ! Check for END= and ERR=.
;  419     0481  2      ! If this is end-of-file (during read)
;  420     0482  2      ! Unwind to the user with the new_pc being .END_ADR and with
;  421     0483  2      ! R0 as an IOSTAT value of -1.
;  422     0484  2      !-
;  423     0485  2
;  424     0486  2      IF ..ENB_ARGS_ADR [END_EQL_ADR] NEQA 0 AND .SIG_ARGS_ADR [CHF$L_SIG_NAME] EQL FOR$_ENDDURREA
;  425     0487  2      THEN
;  426     0488  2          BEGIN
;  427     0489  2
;  428     0490  2          LOCAL
;  429     0491  2              T;
;  430     0492  2
;  431     0493  2          MCH_ARGS_ADR [CHF$L_MCH_SAVRO] = -1;
;  432     0494  2          T = .MCH_ARGS_ADR [CHF$L_MCH_DEPTH] + ..ENB_ARGS_ADR [INCR_DEPTH_ADR] + 1;
;  433     0495  2
;  434     0496  2          IF $UNWIND (DEPADR = T, NEWPC = ..ENB_ARGS_ADR [END_EQL_ADR])
;  435     0497  2          THEN
;  436     0498  2              RETURN SS$_NORMAL
;  437     0499  2          ELSE
;  438     0500  2              FOR$$SIG_FATINT ()
;  439     0501  2
;  440     0502  2          END;
;  441     0503  2
;  442     0504  2      !+
;  443     0505  2      ! If this is an error, and ERR= was specified by the user,
;  444     0506  2      ! Unwind to the user with the new-pc being .ERR_ADR and
;  445     0507  2      ! with R0 set to the proper IOSTAT value.
;  446     0508  2      !-
;  447     0509  2
;  448     0510  2      IF ..ENB_ARGS_ADR [ERR_EQL_ADR] NEQA 0
;  449     0511  2      THEN
;  450     0512  2          BEGIN
;  451     0513  2
;  452     0514  2          LOCAL
;  453     0515  2              T;
;  454     0516  2
;  455     0517  2          IF .SIG_ARGS_ADR [CHF$L_SIG_NAME] EQL FOR$_ENDDURREA
;  456     0518  2          THEN
;  457     0519  2              MCH_ARGS_ADR [CHF$L_MCH_SAVRO] = -1
;  458     0520  2          ELSE
;  459     0521  2              MCH_ARGS_ADR [CHF$L_MCH_SAVRO] = .BLOCK [SIG_ARGS_ADR [CHF$L_SIG_NAME], STS$V_CODE;, BYTE];
;  460     0522  2
;  461     0523  2          T = .MCH_ARGS_ADR [CHF$L_MCH_DEPTH] + ..ENB_ARGS_ADR [INCR_DEPTH_ADR] + 1;
;  462     0524  2
;  463     0525  2          IF $UNWIND (DEPADR = T, NEWPC = ..ENB_ARGS_ADR [ERR_EQL_ADR])
;  464     0526  2          THEN
;  465     0527  2              RETURN SS$_NORMAL
;  466     0528  2          ELSE
;  467     0529  2              FOR$$SIG_FATINT ()
;  468     0530  2
;  469     0531  2          END;
;  470     0532  2
;  471     0533  2      !+
;  472     0534  2      ! If neither END= nor ERR= specified by user.
```

```
        2      ! Scan back from frame of establisher to frame of routine to called by user.
        2      ! Set user CALL PC to library in SIGNAL arg list.
        2      ! Just indicate to the condition handling facility to resignal the condition
        2      ! so that a user supplied handler or the OTS default handler will get a chance to handle.
        2      !-
        2
        2      EST_FP = .MCH_ARGS_ADR [CHF$L_MCH_FRAME];
        2
        2      DECR I FROM ..ENB_ARGS_ADR [INCR_DEPTH_ADR] TO 1 DO
        2          EST_FP = .EST_FP [SF$L_SAVE_FP];
        2
        2      SIG_PC_LOC [0] = .EST_FP [SF$L_SAVE_PC];
        2
        2      RETURN SS$_RESIGNAL
        1      END;                                              !End of FOR$$ERR_ENDHND


                                                                  .EXTRN  SYS$UNWIND

                                              007C 00000          .ENTRY  FOR$$ERR_ENDHND, Save R2,R3,R4,R5,R6          ; 0364
                          56 00000000G  00   9E 00002          MOVAB   FOR$$SIG_FATINT, R6                           ;
                          55 00000000G  00   9E 00009          MOVAB   SYS$UNWIND, R5                                ;
                          5E            08   C2 00010          SUBL2   #8, SP                                        ;
                          52       04   AC   D0 00013          MOVL    SIG_ARGS_ADR, R2                              ; 0458
                          53       04   A2   9E 00017          MOVAB   4(R2), R3                                     ;
00000124   8F         63  19            03   ED 0001B          CMPZV   #3, #25, (R3), #292                           ;
                                        0F   12 00024          BNEQ    1$                                            ;
                          50       0C   AC   D0 00026          MOVL    ENB_ARGS_ADR, R0                              ; 0461
                                   04   B0   DD 0002A          PUSHL   @4(R0)                                        ;
                   0000V  CF            01   FB 0002D          CALLS   #1, CLEANUP_LUB                               ;
                                      0080   31 00032          BRW     7$                                            ; 0462
       18      02  A3     0C            00   ED 00035 1$:      CMPZV   #0, #12, 2(R3), #24                           ; 0470
                                        0B   12 0003B          BNEQ    2$                                            ;
                          50       08   A2   D0 0003D          MOVL    8(R2), R0                                     ; 0474
                          54       08 A240   DE 00041          MOVAL   8(R2)[R0], SIG_PC_LOC                         ;
                                        64   D5 00046          TSTL    (SIG_PC_LOC)                                  ; 0475
                                        03   13 00048 2$:      BEQL    3$                                            ;
                                      0089   31 0004A          BRW     12$                                           ;
                          52       0C   AC   D0 0004D 3$:      MOVL    ENB_ARGS_ADR, R2                              ; 0486
                                   0C   B2   D5 00051          TSTL    @12(R2)                                       ;
                                        2A   13 00054          BEQL    4$                                            ;
                 001880C4 8F            63   D1 00056          CMPL    (R3), #1605828                                ;
                                        21   12 0005D          BNEQ    4$                                            ;
                          50       08   AC   D0 0005F          MOVL    MCH_ARGS_ADR, R0                              ; 0493
                    0C    A0            01   CE 00063          MNEGL   #1, 12(R0)                                    ;
              50    08    A0       10   B2   C1 00067          ADDL3   @16(R2), 8(R0), R0                            ; 0494
                          6E       01   A0   9E 0006D          MOVAB   1(R0), T                                      ;
                                   0C   B2   DD 00071          PUSHL   @12(R2)                                       ; 0496
                                   04   AE   9F 00074          PUSHAB  T                                             ;
                          65            02   FB 00077          CALLS   #2, SYS$UNWIND                                ;
                          38            50   E8 0007A          BLBS    R0, 7$                                        ;
                          66            00   FB 0007D          CALLS   #0, FOR$$SIG_FATINT                           ; 0500
                                   08   B2   D5 00080 4$:      TSTL    @8(R2)                                        ; 0510
                                        37   13 00083          BEQL    9$                                            ;
                          50       08   AC   D0 00085          MOVL    MCH_ARGS_ADR, R0                              ; 0519
                 001880C4 8F            63   D1 00089          CMPL    (R3), #1605828                                ; 0517
```

```
                                          06  12 00090        BNEQ    5$                                    ;
                       0C    A0               01  CE 00092        MNEGL   #1, 12(R0)                            ; 0519
                                          06  11 00096        BRB     6$                                    ;
     0C    A0          63    0C           03  EF 00098 5$:    EXTZV   #3, #12, (R3), 12(R0)                 ; 0521
                       50    08    A0  10  B2  C1 0009E 6$:    ADDL3   @16(R2), 8(R0), R0                    ; 0523
                       04    AE        01  A0  9E 000A4        MOVAB   1(R0), T                              ;
                                       08  B2  DD 000A9        PUSHL   @8(R2)                                ; 0525
                                       08  AE  9F 000AC        PUSHAB  T                                     ;
                             65            02  FB 000AF        CALLS   #2, SYS$UNWIND                        ;
                             04            50  E9 000B2        BLBC    R0, 8$                                ;
                             50            01  D0 000B5 7$:    MOVL    #1, R0                                ; 0527
                                           04 000B8        RET                                           ;
                             66            00  FB 000B9 8$:    CALLS   #0, FOR$$SIG_FATINT                   ; 0529
                             50        08  AC  D0 000BC 9$:    MOVL    MCH_ARGS_ADR, R0                      ; 0541
                             50        04  A0  D0 000C0        MOVL    4(R0), EST_FP                         ;
                       51    10    B2      01  C1 000C4        ADDL3   #1, @16(R2), I                        ; 0543
                                           04  11 000C9        BRB     11$                                   ;
                             50        0C  A0  D0 000CB 10$:   MOVL    12(EST_FP), EST_FP                    ; 0544
                             F9            51  F5 000CF 11$:   SOBGTR  I, 10$                                ;
                             64        10  A0  D0 000D2        MOVL    16(EST_FP), (SIG_PC_LOC)              ; 0546
                             50      0918  8F  3C 000D6 12$:   MOVZWL  #2328, R0                             ; 0548
                                           04 000DB        RET                                           ; 0549

; Routine Size:  220 bytes,    Routine Base:  _FOR$CODE + 008C

;   488          0550  1
```

```
;  490     0551  1 GLOBAL ROUTINE FOR$$IOSTAT_HND (                    ! FORTRAN I/O IOSTAT handler
;  491     0552  1         SIG_ARGS_ADR,                               ! Adr. of signal arg list
;  492     0553  1         MCH_ARGS_ADR,                               ! Adr. of mechanism arg list
;  493     0554  1         ENB_ARGS_ADR)                               ! Adr. of ENABLE arg list
;  494     0555  1     =                                               ! Return status for a condition handler
;  495     0556  1
;  496     0557  1 !++
;  497     0558  1 ! FUNCTIONAL DESCRIPTION:
;  498     0559  1 !
;  499     0560  1 !       FOR$$IOSTAT_HND is an error condition handler established by each
;  500     0561  1 !       auxilliary I/O statement which can have as optional arguments
;  501     0562  1 !       ERR= and IOSTAT=.
;  502     0563  1 !
;  503     0564  1 !       If the enable argument ERR_EQL_ADR is non zero, FOR$$IOSTAT_HND
;  504     0565  1 !       unwinds with the saved R0 set to the appropriate IOSTAT small
;  505     0566  1 !       integer FORTRAN error number.  If ERR_EQL_ADR is zero, then it
;  506     0567  1 !       is assumed that no ERR= is present and the error is resignalled.
;  507     0568  1 !       Note that the unwind is not done to the ERR= address, rather the
;  508     0569  1 !       compiled code makes a test of the returned value and branches
;  509     0570  1 !       to the designated ERR= statement itself.
;  510     0571  1 !
;  511     0572  1 !       If UNWIND occurs, the appropriate cleanup takes place,
;  512     0573  1 !       as indicated by the establisher in the ENABLE arg UNWIND_ACT_ADR.
;  513     0574  1 !       If FOR$K_UNWINDPOP is indicated, the current LUB/ISB/RAB is popped.
;  514     0575  1 !       If FOR$K_UNWINDRET is indicated, the LUB/ISB/RAB is returned and the
;  515     0576  1 !       file closed.
;  516     0577  1 !       Otherwise (FOR$K_UNWINDNOP) nothing is done.
;  517     0578  1 !
;  518     0579  1 ! FORMAL PARAMETERS:
;  519     0580  1 !
;  520     0581  1 !       SIG_ARGS_ADR.ml.ra      Adr. of signal arg list
;  521     0582  1 !       MCH_ARGS_ADR.ml.ra      Adr. of mechanism arg list
;  522     0583  1 !       ENB_ARGS_ADR.ml.ra      Adr. of ENABLE arg list which contains:
;  523     0584  1 !           UNWIND_ACT_ADR.rl.r Adr. of longword contining UNWIND action code.
;  524     0585  1 !                               Any of FOR$K_UNWINDNOP, FOR$K_UNWINDPOP,
;  525     0586  1 !                               FOR$K_UNWINDRET.
;  526     0587  1 !           ERR_EQL_ADR.rl.v    0 if there is no ERR= on the statement
;  527     0588  1 !                               1 if there is an ERR= present.
;  528     0589  1 ! Note: All parameters to a condition handler must be addresses of values in BLISS if used in an ENABLE.
;  529     0590  1 !
;  530     0591  1 ! IMPLICIT INPUTS:
;  531     0592  1 !
;  532     0593  1 !       FOR$$A_CUR_LUB          Adr. of current LUB/ISB/RAB or 0
;  533     0594  1 !                               Note: obtained by calling FOR$$CB_GET rather than directly.
;  534     0595  1 !
;  535     0596  1 ! IMPLICIT OUTPUTS:
;  536     0597  1 !
;  537     0598  1 !       MCH_ARGS_ADR [CHF$L_MCH_SAVR0]  Set to an IOSTAT value
;  538     0599  1 !
;  539     0600  1 ! COMPLETION CODES:
;  540     0601  1 !
;  541     0602  1 !       SS$_RESIGNAL if no ERR= or END= was specified by user, so that
;  542     0603  1 !       a user handler or the default OTS handler will get a chance.
;  543     0604  1 !       SS$_NORMAL if unwind called (although ignored if unwind called)
;  544     0605  1 !
;  545     0606  1 ! SIDE EFFECTS:
;  546     0607  1 !
```

```
;  547     0608  1 !       If ERR= was specified, the stack is unwound to the user.
;  548     0609  1 !       If unwind, the current LUB/ISB/RAB may be popped or returned.
;  549     0610  1 !--
;  550     0611  1
;  551     0612  2     BEGIN
;  552     0613  2
;  553     0614  2     LOCAL
;  554     0615  2         EST_FP : REF BLOCK [, BYTE],                ! Establisher's FP
;  555     0616  2         SIG_PC_LOC: REF VECTOR [, LONG];            ! Location of user PC in signal list
;  556     0617  2
;  557     0618  2     LITERAL                                         ! Declare offsets in ENABLE VECTOR arg list
;  558     0619  2         UNWIND_ACT_ADR = 1,                         ! UNWIND action code
;  559     0620  2         ERR_EQL_ADR = 2;                            ! ERR= present, 1 or 0
;  560     0621  2
;  561     0622  2     MAP
;  562     0623  2         SIG_ARGS_ADR : REF BLOCK [, BYTE],          ! SIGNAL arg list
;  563     0624  2         MCH_ARGS_ADR : REF BLOCK [, BYTE],          ! mechanism arg list
;  564     0625  2         ENB_ARGS_ADR : REF VECTOR [ERR_EQL_ADR + 1, LONG];      ! ENABLE arg list
;  565     0626  2
;  566     0627  2     !+
;  567     0628  2     ! Check for unwinding since handler gets called when it does an unwind.
;  568     0629  2     ! If unwind, perform cleanup indicated by ENABLE arg UNWIND_ACT_ADR.
;  569     0630  2     ! Then return to the unwinder to keep unwinding (return value ignored).
;  570     0631  2     !-
;  571     0632  2
;  572     0633  2     IF .BLOCK [SIG_ARGS_ADR [CHF$L_SIG_NAME], STS$V_COND_ID;, BYTE] EQL (SS$_UNWIND^-3)
;  573     0634  2     THEN
;  574     0635  3         BEGIN
;  575     0636  3         CLEANUP_LUB (..ENB_ARGS_ADR [UNWIND_ACT_ADR]);
;  576     0637  3         RETURN SS$_NORMAL;
;  577     0638  3         END;
;  578     0639  2
;  579     0640  2     !+
;  580     0641  2     ! If this is not a FOR$ error or if another RTL handler has seen this
;  581     0642  2     ! error (noted by signal argument for user PC being non-zero) then
;  582     0643  2     ! just resignal.
;  583     0644  2     !-
;  584     0645  2
;  585     0646  2     IF .BLOCK [SIG_ARGS_ADR [CHF$L_SIG_NAME], STS$V_FAC_NO;, BYTE] NEQ FOR$K_FAC_NO
;  586     0647  2     THEN
;  587     0648  2         RETURN SS$_RESIGNAL;
;  588     0649  2     SIG_PC_LOC = SIG_ARGS_ADR [CHF$L_SIG_ARG1] + (.SIG_ARGS_ADR [CHF$L_SIG_ARG1] * %UPVAL);
;  589     0650  2     IF .SIG_PC_LOC [0] NEQ 0
;  590     0651  2     THEN
;  591     0652  2         RETURN SS$_RESIGNAL;
;  592     0653  2
;  593     0654  2     !+
;  594     0655  2     ! If this is an error, and ERR= was specified by the user,
;  595     0656  2     ! Unwind to the user with saved R0 being the IOSTAT value.
;  596     0657  2     !-
;  597     0658  2
;  598     0659  2     IF ..ENB_ARGS_ADR [ERR_EQL_ADR] NEQA 0
;  599     0660  2     THEN
;  600     0661  3         BEGIN
;  601     0662  3         MCH_ARGS_ADR [CHF$L_MCH_SAVR0] = .BLOCK [SIG_ARGS_ADR [CHF$L_SIG_NAME], STS$V_CODE;, BYTE];
;  602     0663  3
;  603     0664  4         IF $UNWIND ()
```

```
;  604     0665  3          THEN
;  605     0666  3              RETURN SS$_NORMAL
;  606     0667  3          ELSE
;  607     0668  3              FOR$$SIG_FATINT ();
;  608     0669  3
;  609     0670  3          END;
;  610     0671  2
;  611     0672  2      !+
;  612     0673  2      ! If ERR= not specified by the user
;  613     0674  2      ! scan back from frame of establisher to frame of routine to called by user.
;  614     0675  2      ! Set user CALL PC to library in SIGNAL arg list.
;  615     0676  2      ! Just indicate to the condition handling facility to resignal the condition
;  616     0677  2      ! so that a user supplied handler or the OTS default handler will get a chance to handle.
;  617     0678  2      !-
;  618     0679  2
;  619     0680  2      EST_FP = .MCH_ARGS_ADR [CHF$L_MCH_FRAME];
;  620     0681  2      SIG_PC_LOC [0] = .EST_FP [SF$L_SAVE_PC];
;  621     0682  2      RETURN SS$_RESIGNAL
;  622     0683  1      END;                                    !End of FOR$$IOSTAT_HND


                                    000C 00000          .ENTRY  FOR$$IOSTAT_HND, Save R2,R3                     ; 0551
                              52    04   AC  D0 00002    MOVL    SIG_ARGS_ADR, R2                                ; 0633
00000124  8F      04   A2     19          03  ED 00006    CMPZV   #3, #25, 4(R2), #292                            ;
                                          0E  12 00010    BNEQ    1$                                              ;
                              50    0C   AC  D0 00012    MOVL    ENB_ARGS_ADR, R0                                ; 0636
                                    04   B0  DD 00016    PUSHL   @4(R0)                                          ;
                        0000V CF                  01  FB 00019    CALLS   #1, CLEANUP_LUB                         ;
                                          35  11 0001E    BRB     2$                                              ; 0637
          18      06   A2               00  ED 00020 1$: CMPZV   #0, #12, 6(R2), #24                             ; 0646
                                          44  12 00026    BNEQ    5$                                              ;
                              50    08   A2  D0 00028    MOVL    8(R2), R0                                       ; 0649
                              53    08 A240  DE 0002C    MOVAL   8(R2)[R0], SIG_PC_LOC                           ;
                                          63  D5 00031    TSTL    (SIG_PC_LOC)                                    ; 0650
                                          37  12 00033    BNEQ    5$                                              ;
                              50    0C   AC  D0 00035    MOVL    ENB_ARGS_ADR, R0                                ; 0659
                                    08   B0  D5 00039    TSTL    @8(R0)                                          ;
                                          22  13 0003C    BEQL    4$                                              ;
                              50    08   AC  D0 0003E    MOVL    MCH_ARGS_ADR, R0                                ; 0662
    0C    A0      04   A2               0C  03  EF 00042    EXTZV   #3, #12, 4(R2), 12(R0)                          ;
                                          7E  7C 00049    CLRQ    -(SP)                                           ; 0664
                        00000000G 00              02  FB 0004B    CALLS   #2, SYS$UNWIND                          ;
                                          04  50  E9 00052    BLBC    R0, 3$                                          ;
                              50              01  D0 00055 2$: MOVL    #1, R0                                  ; 0666
                                          04  00  58          RET                                             ;
                        00000000G 00              00  FB 00059 3$: CALLS   #0, FOR$$SIG_FATINT                     ; 0668
                              50    08   AC  D0 00060 4$: MOVL    MCH_ARGS_ADR, R0                                ; 0680
                              50    04   A0  D0 00064    MOVL    4(R0), EST_FP                                   ;
                              63    10   A0  D0 00068    MOVL    16(EST_FP), (SIG_PC_LOC)                        ; 0681
                              50  0918   8F  3C 0006C 5$: MOVZWL  #2328, R0                                      ; 0682
                                          04  00071       RET                                                     ; 0683

; Routine Size:  114 bytes,    Routine Base:  _FOR$CODE + 0168
```

```
;  623          0684  1
```

```
;  625     0685  1 GLOBAL ROUTINE FOR$$IO_IN_PROG (                    ! I/O in progress handler
;  626     0686  1         SIG_ARGS_ADR,                               ! Address of signal arg list
;  627     0687  1         MCH_ARGS_ADR)                               ! Address of mechanism arg list
;  628     0688  1     =
;  629     0689  1
;  630     0690  1 !++
;  631     0691  1 ! FUNCTIONAL DESCRIPTION:
;  632     0692  1 !
;  633     0693  1 !       FOR$$IO_IN_PROG is a special handler that is designed to
;  634     0694  1 !       allow the Run-Time Library to clean I/O that is in progress
;  635     0695  1 !       when an error occurs during the processing of a multi-call
;  636     0696  1 !       I/O statement.  For example, if evaluation of a variable
;  637     0697  1 !       list item in a WRITE statement causes an error to be signalled,
;  638     0698  1 !       there is no RTL handler in the stack frame to catch the error
;  639     0699  1 !       and clean up in the case of an unwind
;  640     0700  1 !
;  641     0701  1 !       This handler is enabled at the user's stack frame level.  The
;  642     0702  1 !       address of whatever user handler that was in the frame is stored
;  643     0703  1 !       in the ISB.  When an error is signalled, this handler finds
;  644     0704  1 !       the address of the user handler, if any, and calls it.  There
;  645     0705  1 !       should be no normally detectable difference caused by FOR$$IO_IN_PROG
;  646     0706  1 !       being on the frame.  On unwind, the current ISB is popped and the
;  647     0707  1 !       user's handler is called again.  This way, we are protected against
;  648     0708  1 !       all errors on all call levels.
;  649     0709  1 !
;  650     0710  1 ! FORMAL PARAMETERS:
;  651     0711  1 !
;  652     0712  1 !       SIG_ARGS_ADR.ml.ra      Address of signal arguments list
;  653     0713  1 !       MCH_ARGS_ADR.ml.ra      Address of mechanism arguments list
;  654     0714  1 !
;  655     0715  1 ! IMPLICIT INPUTS:
;  656     0716  1 !
;  657     0717  1 !       ISB/LUB/RAB database
;  658     0718  1 !
;  659     0719  1 ! IMPLICIT OUTPUTS:
;  660     0720  1 !
;  661     0721  1 !       ISB/LUB/RAB database
;  662     0722  1 !
;  663     0723  1 ! COMPLETION CODES:
;  664     0724  1 !
;  665     0725  1 !       Whatever is returned by the user handler.
;  666     0726  1 !--
;  667     0727  1
;  668     0728  2     BEGIN
;  669     0729  2
;  670     0730  2     GLOBAL REGISTER
;  671     0731  2         CCB = 11 : REF $FOR$CCB_DECL;
;  672     0732  2
;  673     0733  2     BUILTIN
;  674     0734  2         CALLG,
;  675     0735  2         AP;
;  676     0736  2
;  677     0737  2     LOCAL
;  678     0738  2         USER_HANDLER,                               ! Address of user's handler
;  679     0739  2         EST_FP : REF BLOCK [, BYTE];                ! Establisher's FP
;  680     0740  2
;  681     0741  2     MAP
```

```
;  682     0742  2          SIG_ARGS_ADR : REF BLOCK [, BYTE],      ! signal argument list
;  683     0743  2          MCH_ARGS_ADR : REF BLOCK [, BYTE];      ! mechanism argument list
;  684     0744  2
;  685     0745  2      !+
;  686     0746  2      ! Get establisher's FP
;  687     0747  2      !-
;  688     0748  2
;  689     0749  2      EST_FP = .MCH_ARGS_ADR [CHF$L_MCH_FRAME];
;  690     0750  2
;  691     0751  2      !+
;  692     0752  2      ! See if we are unwinding.
;  693     0753  2      !-
;  694     0754  2
;  695     0755  2      IF .BLOCK [SIG_ARGS_ADR [CHF$L_SIG_NAME], STS$V_COND_ID;, BYTE] EQL (SS$_UNWIND^-3)
;  696     0756  2      THEN
;  697     0757  2          BEGIN
;  698     0758  2          FOR$$CB_GET ();                         ! Get address of current LUB
;  699     0759  2
;  700     0760  2          IF .EST_FP NEQ .CCB [ISB$A_USER_FP] THEN FOR$$SIG_FATINT ();    ! Error
;  701     0761  2
;  702     0762  2          USER_HANDLER = .CCB [ISB$A_USR_HANDL];  ! Get user's handler address
;  703     0763  2          CLEANUP_LUB (FOR$K_UNWINDPOP);          ! Clean up LUB and restore user's handler
;  704     0764  2
;  705     0765  2          IF .USER_HANDLER NEQ 0 THEN RETURN CALLG (.AP, .USER_HANDLER);
;  706     0766  2
;  707     0767  2          RETURN SS$_NORMAL;
;  708     0768  2          END;
;  709     0769  2
;  710     0770  2      !+
;  711     0771  2      ! This is a signal.  Find the ISB that matched the establisher's
;  712     0772  2      ! FP.
;  713     0773  2      !-
;  714     0774  2
;  715     0775  2      FOR$$FP_MATCH (.EST_FP);
;  716     0776  2
;  717     0777  2      !+
;  718     0778  2      ! Call user's handler and return.
;  719     0779  2      !-
;  720     0780  2
;  721     0781  2      USER_HANDLER = .CCB [ISB$A_USR_HANDL];
;  722     0782  2
;  723     0783  2      IF .USER_HANDLER NEQ 0 THEN RETURN CALLG (.AP, .USER_HANDLER) ELSE RETURN SS$_RESIGNAL;
;  724     0784  2
;  725     0785  1      END;                                        ! End of FOR$$IO_IN_PROG


                                    080C 00000     .ENTRY  FOR$$IO_IN_PROG, Save R2,R3,R11          ; 0685
                              50    08   AC  D0 00002  MOVL   MCH_ARGS_ADR, R0                       ; 0749
                              53    04   A0  D0 00006  MOVL   4(R0), EST_FP                         ;
                              50    04   AC  D0 0000A  MOVL   SIG_ARGS_ADR, R0                      ; 0755
00000124  8F        04  A0        19       03  ED 0000E  CMPZV  #3, #25, 4(R0), #292               ;
                                           28  12 00018  BNEQ   2$                                 ;
                                 00000000G 00  16 0001A  JSB    FOR$$CB_GET                       ; 0758
                          FF4C  CB         53  D1 00020  CMPL   EST_FP, -180(CCB)                  ; 0760
```

```
                                        07  13 00025          BEQL    1$
                                        00  FB 00027          CALLS   #0, FOR$$SIG_FATINT
                    00000000G   00      52  CB 0002E 1$:      MOVL    -188(CCB), USER_HANDLER                 ;0762
                                52  FF44   7E  D4 00033          CLRL    -(SP)                               ;0763
                                        01  FB 00035          CALLS   #1, CLEANUP_LUB
                                0000V   CF  52  D5 0003A          TSTL    USER_HANDLER                        ;0765
                                        14  12 0003C          BNEQ    3$
                                    50  01  D0 0003E          MOVL    #1, R0                              ;0767
                                        04  00041          RET
                                        53  DD 00042 2$:      PUSHL   EST_FP                              ;0775
                    00000000G   00      01  FB 00044          CALLS   #1, FOR$$FP_MATCH
                                52  FF44   CB  D0 0004B          MOVL    -188(CCB), USER_HANDLER             ;0781
                                        04  13 00050          BEQL    4$                                  ;0783
                                    62  6C  FA 00052 3$:      CALLG   (AP), (USER_HANDLER)
                                        04  00055          RET
                                    50  0918   8F  3C 00056 4$:      MOVZWL  #2328, R0
                                        04  0005B          RET                                         ;0785

; Routine Size:  92 bytes,    Routine Base:  _FOR$CODE + 01DA

;  726          0786  1
```

```
;  728     0787  1 ROUTINE CLEANUP_LUB (ACTION) : NOVALUE =
;  729     0788  1
;  730     0789  1 !++
;  731     0790  1 ! FUNCTIONAL DESCRIPTION:
;  732     0791  1 !
;  733     0792  1 !       Perform the UNWIND action indicated by ACTION on the current LUB.
;  734     0793  1 !
;  735     0794  1 ! FORMAL PARAMETERS:
;  736     0795  1 !
;  737     0796  1 !       ACTION.rlu.v            FOR$K_UNWINDNOP, FOR$K_UNWINDPOP, or FOR$K_UNWINDRET.
;  738     0797  1 !
;  739     0798  1 !--
;  740     0799  1
;  741     0800  2     BEGIN
;  742     0801  2
;  743     0802  2     GLOBAL REGISTER
;  744     0803  2         CCB = 11 : REF $FOR$CCB_DECL;
;  745     0804  2
;  746     0805  2     BIND
;  747     0806  2         FAB = CCB: REF $FOR$FAB_CCB_STRUCT;
;  748     0807  2
;  749     0808  2     CASE .ACTION FROM FOR$K_UNWINDPOP TO FOR$K_UNWINDRET OF
;  750     0809  2         SET
;  751     0810  2
;  752     0811  2             !+
;  753     0812  2             ! If the UNWIND action is to pop the LUB/ISB/RAB, call CB_POP to do
;  754     0813  2             ! the work.
;  755     0814  2             !-
;  756     0815  2
;  757     0816  2             [FOR$K_UNWINDPOP] :
;  758     0817  3                 BEGIN
;  759     0818  3
;  760     0819  3                 LOCAL
;  761     0820  3                     USER_FP;                        ! User's FP
;  762     0821  3
;  763     0822  3                 FOR$$CB_GET ();                     ! CCB set to adr. of current /LUB/ISB/RAB
;  764     0823  3                 USER_FP = .CCB [ISB$A_USER_FP];     ! Get user's FP
;  765     0824  3
;  766     0825  3                 IF .USER_FP NEQ 0 THEN .USER_FP = .CCB [ISB$A_USR_HANDL];   ! Restore user's handler
;  767     0826  3
;  768     0827  3                 CCB [RAB$L_UBF] = .CCB [LUB$A_RBUF_ADR];
;  769     0828  3                 CCB [RAB$W_USZ] = .CCB [LUB$W_RBUF_SIZE];
;  770     0829  3                 FOR$$CB_POP ();
;  771     0830  2                 END;
;  772     0831  2
;  773     0832  2             !+
;  774     0833  2             ! If the UNWIND action is NOP, do nothing.
;  775     0834  2             !-
;  776     0835  2
;  777     0836  2             [FOR$K_UNWINDNOP] :
;  778     0837  2             ;
;  779     0838  2
;  780     0839  2             !+
;  781     0840  2             ! If the UNWIND action is RET, then try to $CLOSE the file associated
;  782     0841  2             ! with this LUB/ISB/RAB.  Deallocate any dynamic storage associated
;  783     0842  2             ! with this LUB.  Return the LUB/ISB/RAB to free storage.
;  784     0843  2
```

```
;  2          [FOR$K_UNWINDRET] :
;  3              BEGIN
;  3              FOR$$CB_GET ();                         ! Set CCB to adr. of current LUB/ISB/RAB
;  3  !+
;  3  ! See if file is RMS opened.
;  3  !-
;  3
;  4              IF (.FAB [FAB$W_IFI] NEQ 0)
;  3              THEN
;  3  !+
;  3  ! Do an RMS Close of the file, and arrange to deallocate its LUB/ISB/RAB
;  3  ! when all I/O to it is finished.  Normally, we are doing the only I/O
;  3  ! to it.
;  3  !-
;  3                  FOR$$CLOSE_FILE ()
;  3              ELSE
;  3  !+
;  3  ! Even though the file is not open, we wish to deallocate the LUB, since
;  3  ! this is the simplest way to reinitialize it if the user tries to use
;  3  ! the logical unit number again, so tell OTS$$POP_CCB to deallocate it.
;  3  !-
;  3                  CCB [LUB$V_DEALLOC] = 1;
;  3
;  3  !+
;  3  ! We are done with the logical unit.
;  3  !-
;  3              FOR$$CB_POP ();
;  2              END;
;  2          TES;
;  1      END;



                                         0804 00000 CLEANUP_LUB:
                                                           .WORD   Save R2,R11                            ; 0787
                  52 00000000G   00   9E 00002             MOVAB   FOR$$CB_GET, R2
      02          00        04   AC   CF 00009             CASEL   ACTION, #0, #2                         ; 0808
    0020        003A      0006           0000E 1$:         .WORD   2$-1$,-
                                                                   7$-1$,-
                                                                   4$-1$
                                 62   16 00014 2$:         JSB     FOR$$CB_GET                            ; 0822
                  50      FF4C   CB   D0 00016             MOVL    -180(CCB), USER_FP                     ; 0823
                                 05   13 0001B             BEQL    3$                                     ; 0825
                  60      FF44   CB   D0 0001D             MOVL    -188(CCB), (USER_FP)
          24      AB        EC   AB   D0 00022 3$:         MOVL    -20(CCB), 36(CCB)                      ; 0827
          20      AB        D2   AB   B0 00027             MOVW    -46(CCB), 32(CCB)                      ; 0828
                                 14   11 0002C             BRB     6$                                     ; 0829
                                 62   16 0002E 4$:         JSB     FOR$$CB_GET                            ; 0846
                            46   AB   B5 00030             TSTW    70(FAB)                                ; 0851
                                 09   13 00033             BEQL    5$
      00000000G   00             00   FB 00035             CALLS   #0, FOR$$CLOSE_FILE                    ; 0858
                                 04   11 0003C             BRB     6$
             FF   AB             10   88 0003E 5$:         BISB2   #16, -1(FAB)                           ; 0865
                  00000000G      00   16 00042 6$:         JSB     FOR$$CB_POP                            ; 0870
```

```
                                        04 00048 7$:     RET                                    ; 0874

; Routine Size:  73 bytes,    Routine Base:  _FOR$CODE + 0236

;  816          0875  1
;  817          0876  1 END                                    !End of module
;  818          0877  1
;  819          0878  0 ELUDOM



;                                  PSECT SUMMARY
;
;      Name                      Bytes                        Attributes
;
;  _FOR$CODE                       639  NOVEC,NOWRT,  RD ,  EXE,  SHR,  LCL,  REL,  CON,  PIC,ALIGN(2)



;                          Library Statistics
;                                          -------- Symbols --------      Pages       Processing
;      File                                Total    Loaded   Percent      Mapped      Time
;
;  _$255$DUA28:[SYSLIB]STARLET.L32;1        9776        18         0         581        00:01.0
;  _$255$DUA28:[FORRTL.OBJ]FORLIB.L32;1      711       190        26          52        00:00.6
;  _$255$DUA28:[FORRTL.OBJ]RTLLIB.L32;1       36         0         0           8        00:00.1



;                                  COMMAND QUALIFIERS
;
;       BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/NOTRACE/LIS=LIS$:FORERROR/OBJ=OBJ$:FORERROR MSRC$:FORERROR/UPDATE=(ENH$:FORERROR)

; Size:         639 code + 0 data bytes
; Run Time:       00:16.9
; Elapsed Time:   00:45.4
; Lines/CPU Min:   3120
; Lexemes/CPU-Min: 15828
; Memory Used:  119 pages
; Compilation Complete
```

FORFIND
LIS

FORFMTINT
LIS

FOREXITHA
LIS

FORENODEF
LIS

FORENCOMF
LIS

FORIDATE
LIS

FORENDFIL
LIS

FORERRSNS
LIS

FOREXIT
LIS

FORERROR
LIS

FORFMTCP
LIS

FORENCOMO
LIS

FORINIDES
LIS